Memorandum

To: *Diane Salkie, EPA Region 2*
Elizabeth Franklin, USACE

From: *Troy Gallagher, CDM Smith*
Scott Kirchner, CDM Smith

Date: *January 3, 2020*

Subject: *Summary of Oversight of SPME Sampler Retrieval Effort at River Mile 10.9*
December 10-12, 2019
Lower Passaic River Restoration Project

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), Kansas City District, CDM Federal Programs Corporation (CDM Smith) traveled to the River Mile (RM) 10.9 removal area on December 10, 11, and 12, 2019. CDM Smith provided field technical oversight of the retrieval of solid-phase microextraction (SPME) samplers that had been installed on September 28, 29, and 30, 2019 at Stations 0601, 0602, 0603, 0604, 0605, 0606, 0607, 0608, 0609, and 0610. These field activities were conducted by AECOM on behalf of the Cooperating Parties Group (CPG).

The SPME samplers retrieved by AECOM during the December 2019 field efforts had been installed as part of a post-construction monitoring event for the RM 10.9 sediment cap. The SPME passive porewater samplers are intended to assess dissolved contaminant concentrations in porewater in the sediment bed below the cap, in the active cap layer, and in the armor stone layer of the RM 10.9 cap. These samplers are part of an performance monitoring event that includes SPME sampling at the ten planned locations along the length of the RM 10.9 cap. Three samplers were installed at each of the ten stations during the September 2019 mobilization, with one set of duplicate samplers installed at Station 0606. The three SPME samplers installed at each location were as follows:

- A deep sampler, installed in the underlying sediment at approximately 40 inches below the mudline (tagged with orange zip ties and orange tape)
- A mid-depth sampler, installed in the active layer at approximately 24 inches below the mudline, about 6 inches below the geotextile fabric (tagged with yellow zip ties and yellow tape)
- A shallow sampler, installed in the armor layer at approximately 16 inches below the mudline, above the geotextile fabric in the armor layer (tagged with green zip ties and green tape)

Photographs of these December 2019 field activities are presented in Attachment 1. A copy of the field logbook notes and fiber measurement pictures are provided in Attachment 2.

Summary of Wednesday, December 10th, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Helen Jones – AECOM
Marc Smith – AECOM
Claire Murphy-Hagan – AECOM
Patrick Fellion – AECOM
Briley Barra – AECOM
Chrisy Puopolo – AECOM

General Summary

The December 10, 2019 field activities consisted of:

- Collection of five total grab samples of the soft sediments deposited above the cap at Stations 0601, 0602, 0603, 0604, and 0605.
- Retrieval of 15 SPME passive samplers from Stations 0601, 0602, 0603, 0604, and 0605.
- Processing fibers from six of the retrieved SPME samplers for chemical analyses. The fibers from the remaining nine samplers retrieved on December 10th were processed on December 11th due to fading daylight on December 10th.

Sediment Sampling

AECOM collected a grab sample of the soft surface sediments on top of the cap at each sample station prior to retrieving the SPME samplers, as required by the Quality Assurance Project Plan ("QAPP", AECOM 2015). Sediment sampling locations and collection times are noted in Table 1 below.

Table 1: December 10, 2019 Sediment Sample Summary

Collection Time	Sample Location	Notes
13:40	Station 0603	Sample collected between all three SPME samplers
14:00	Station 0602	Sample collected between all three SPME samplers
14:25	Station 0601	Sample collected between all three SPME samplers
15:10	Station 0604	Sample collected between all three SPME samplers
15:45	Station 0605	Sample collected between all three SPME samplers

The aforementioned sediment samples were collected from an interval extending from the surface of the sediments overlying the armor layer to approximately 5 to 6 inches down (i.e., the sample interval was above the armor layer). At Stations 0601, 0602, 0603, 0604, and 0605, a stainless steel spoon was

used to collect the sediment sample and transfer the sediment sample into amber glass sample jars. The sediments at each location appeared to be very loosely consolidated, with a high water content. The sediment sample collection process lasted approximately 3 minutes for each sample exclusive of preparation time.

Five total sample jars were filled and packaged.

SPME Sampler Retrieval and Sample Processing

The 15 SPME samplers retrieved on December 10th were installed on September 28-30, 2019. All SPME samplers retrieved on December 10th appeared to be straight and unbent with the exception of the active layer sampler from cap Station 0604, as noted in Table 2 below.

Table 2: December 10, 2019 SPME Sample Retrieval Summary

Station Location	Collection Time	Planned Sample Interval	Notes
0603	13:42	Armor Layer	Sampler appears straight.
	13:45	Active Layer	Sampler appears straight.
	13:48	Underlying Sediment	Sampler appears straight.
0602	14:05	Armor Layer	Sampler appears straight.
	14:08	Active Layer	Sampler appears straight.
	14:11	Underlying Sediment	Sampler appears straight.
0601	14:30	Armor Layer	Sampler appears straight.
	14:32	Active Layer	Sampler appears straight.
	14:35	Underlying Sediment	Sampler appears straight.
0604	15:13	Armor Layer	Sampler appears straight.
	15:16	Active Layer	Sampler is bent on the top half that was protruding out of the water (**Photograph 11**)
	15:20	Underlying Sediment	Sampler appears straight.
0605	15:48	Armor Layer	Sampler appears straight.
	15:51	Active Layer	Sampler appears straight.
	15:54	Underlying Sediment	Sampler appears straight.

Empty SPME samplers whose fibers have already been removed were driven back into the sediment at each location at the end of the day. These rods will be used to help identify the sample stations during subsequent sampling events.

The samplers were rinsed with Talex water on the shoreline and then wrapped in aluminum foil following retrieval. The samplers were then processed on shore by AECOM personnel. If the samplers were not to be processed immediately after retrieval, the samplers were kept wrapped in aluminum foil and stored in the AECOM warehouse until they were ready to be processed. The sampler that was used to collect the field blank fiber sample was held in this same way. The general processing steps were as follows: The samplers were cut open just above the screening interval using a pipe cutter, and the Henry sampler was removed from the casing. Fibers were removed from the Henry sampler and rinsed with Talex water over clean aluminum trays. Any tape (used to secure the fibers during deployment) or SPME fibers covered by tape were cut from the exposed fiber portions using an X-ACTO® knife and disposed of. A squirt bottle of Talex water was used to spray water into the Henry sampler and "push" the SPME fibers out if the fibers had come loose from the tape and had become lodged in the Henry sampler.

Fibers were cleaned individually in the aluminum tray using Talex water and wiping off the loose sediment by passing the fiber through their fingers while wearing nitrile gloves. Fibers were retrieved from the aluminum tray with tweezers and placed on a clean piece of aluminum foil parallel to each other. Fibers longer than approximately 6 inches (in) in length were cut into two smaller pieces as they would not fit into the amber vials. Fibers were measured with a caliber, had their lengths recorded, and were placed in a labeled amber vial with Talex water. Processing of the SPME samplers generally lasted between 20 to 30 minutes per sampler, depending on the difficulty of fiber extraction. All fiber lengths were measured by H. Jones and B. Barra and recorded by H. Jones, B. Barra and C. Murphy-Hagan. H. Jones and B. Barra processed samplers at the same time to maximize production.

Each sampler was deployed with nine SPME fibers. Most fibers remained intact when retrieved. A summary of the retrieved SPME fiber lengths is provided in Table 3. Samplers were processed on this day under a canopy set up in Riverside County Park in Lyndhurst, New Jersey.

Table 3: December 10, 2019 SPME Fiber Length Summary

Start Time of Processing	Sample Location	Measured Fiber Recovery
13:45	Station 0603, Armor Layer	54.362 in total fiber length recovered
14:25	Station 0603, Active Layer	56.509 in total fiber length recovered
14:25	Station 0603, Underlying Sediment	56.811 in total fiber length recovered
16:21	Station 0601, Armor Layer	44.896 in total fiber length recovered
16:48	Station 0601, Active Layer	49.777 in total fiber length recovered
17:04	Station 0601, Underlying Sediment	56.950 in total fiber length recovered

In- inches

The fibers removed from the active layer SPME sampler from cap Station 0604, which was bent upon retrieval, were mostly intact and did not appear affected by the bending. The remaining nine samplers that were collected on December 10th but were not processed the same day were kept in foil to be processed the following day. These samplers included Station 0602 armor layer, active layer, and

underlying sediment; Station 0604 armor layer, active layer, and underlying sediment; and Station 0605 armor layer, active layer, and underlying sediment layer.

Summary of Thursday, December 11th, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Helen Jones – AECOM
Marc Smith – AECOM
Claire Murphy-Hagan – AECOM
Patrick Fellion – AECOM
Briley Barra – AECOM
Chrisy Puopolo – AECOM

General Summary

The December 11, 2019 field activities consisted of:

- Collection of six total grab samples of the soft sediments deposited above the cap at Stations 0606, 0606 duplicate, 0607, 0608, 0609, and 0610.
- Retrieval of 18 total SPME passive samplers from Stations 0606, 0606 duplicate, 0607, 0608, 0609, and 0610.
- Processing fibers from nine of the samplers retrieved December 10th

Sediment Sampling

AECOM collected a grab sample of the soft surface sediments on top of the cap at each sample station prior to retrieving the SPME samplers, as required by the QAPP (AECOM 2015). These activities were similar to the sediment sampling conducted on December 10. Sediment sampling locations and collection times are noted in Table 4 below.

Table 4: December 11, 2019 Sediment Sample Summary

Collection Time	Sample Location	Notes
14:10	Station 0607	Sample collected between all three SPME samplers
14:45	Station 0606	Sample collected between all three SPME samplers
14:50	Station 0606 (dup)	Sample collected between all three SPME samplers
15:10	Station 0608	Sample collected between all three SPME samplers
15:30	Station 0610	Sample collected between all three SPME samplers
15:50	Station 0609	Sample collected between all three SPME samplers

Sediment samples were collected in the same manner as described in the summary of December 10, 2019 field activities. At Station 0609, the sediment remained submerged during collection so the

sediment sample was collected with a peat sampler so that the sediment could be collected, and excess water could be drained before sample processing.

Six total sample jars were filled and packaged for shipment.

SPME Sampler Retrieval and Sample Processing

The 18 SPME samplers retrieved during the December 11 field effort were installed on September 28-30, 2019. All SPME samplers retrieved on December 11 appeared to be straight and unbent with the exception of the underlying sediment layer sampler from cap Station 0610, as noted in Table 2 below.

Table 5: December 11, 2019 SPME Sample Retrieval Summary

Station Location	Collection Time	Planned Sample Interval	Notes
0607	14:12	Armor Layer	Sampler appears straight.
	14:15	Active Layer	Sampler appears straight.
	14:18	Underlying Sediment	Sampler appears straight.
0606	14:53	Armor Layer	Sampler appears straight.
	14:56	Active Layer	Sampler appears straight.
	14:59	Underlying Sediment	Sampler appears straight.
0606 (dup)	15:01	Armor Layer	Sampler appears straight.
	15:04	Active Layer	Sampler appears straight.
	15:06	Underlying Sediment	Sampler appears straight.
0608	15:15	Armor Layer	Sampler appears straight.
	15:18	Active Layer	Sampler appears straight.
	15:22	Underlying Sediment	Sampler appears straight.
0610	15:32	Armor Layer	Sampler appears straight.
	15:35	Active Layer	Sampler appears straight.
	15:38	Underlying Sediment	Sampler appears bent on the screened interval where the fibers are housed (**Photograph 16**)
0609	15:53	Armor Layer	Sampler appears straight.
	15:56	Active Layer	Sampler appears straight.
	15:59	Underlying Sediment	Sampler appears straight.

The general processing steps were the same as described in the summary of December 10, 2019 field activities. Most fibers were intact. A summary of the length of SPME fibers retrieved is provided in the following Table 6. Samplers were processed on this day at the AECOM warehouse located at 1 Madison Street, Rutherford, New Jersey.

Table 6: December 11, 2019 SPME Fiber Length Summary

Start Time of Processing	Sample Location	Measured Fiber Recovery
10:10	Station 0602, Armor Layer	57.638 in total fiber length recovered
10:10	Station 0602, Active Layer	53.104 in total fiber length recovered
11:00	Station 0602, Underlying Sediment	55.975 in total fiber length recovered
11:30	Station 0604, Armor Layer	57.574 in total fiber length recovered
11:30	Station 0604, Active Layer	53.105 in total fiber length recovered
12:15	Station 0604, Underlying Sediment	54.579 in total fiber length recovered
16:45	Station 0605, Armor Layer	61.102 in total fiber length recovered
16:45	Station 0605, Active Layer	56.105 in total fiber length recovered
17:10	Station 0605, Underlying Sediment	54.680 in total fiber length recovered

in -inches

Summary of Thursday, December 12th, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Helen Jones – AECOM
Marc Smith – AECOM
Claire Murphy-Hagan – AECOM
Patrick Fellion – AECOM
Briley Barra – AECOM
Chrisy Puopolo – AECOM

General Summary

The December 12, 2019 field activities consisted of:

- Processing fibers from remaining SPME samplers collected on December 11th
- Processing field blank fibers

SPME Sample Processing

Eighteen samplers had been collected on December 11th but were not processed until December 12th due to fading daylight on December 11th. The general processing steps were the same as described in the summary of December 10, 2019 field activities. Most fibers were intact. A summary of the SPME fiber lengths retrieved is provided in Table 7. A field blank set of fibers was also processed during this day's activities.

Table 7: December 12, 2019 SPME Fiber Length Summary

Start Time of Processing	Sample Location	Measured Fiber Recovery
09:50	Field Blank	54.930 in total fiber length recovered
10:15	Station 0607, Armor Layer	47.887 in total fiber length recovered
10:15	Station 0607, Active Layer	54.471 in total fiber length recovered
10:50	Station 0607, Underlying Sediment	54.370 in total fiber length recovered
10:50	Station 0606, Armor Layer	56.316 in total fiber length recovered
11:10	Station 0606, Active Layer	52.962 in total fiber length recovered
11:10	Station 0606, Underlying Sediment	55.756 in total fiber length recovered
11:35	Station 0606 duplicate, Armor Layer	56.335 in total fiber length recovered
11:35	Station 0606 duplicate, Active Layer	54.850 in total fiber length recovered
11:50	Station 0606 duplicate, Underlying Sediment	56.669 in total fiber length recovered
12:10	Station 0608, Armor Layer	57.079 in total fiber length recovered
12:10	Station 0608, Active Layer	55.472 in total fiber length recovered
12:35	Station 0608, Underlying Sediment	56.129 in total fiber length recovered
13:25	Station 0610, Armor Layer	55.593 in total fiber length recovered
13:25	Station 0610, Active Layer	55.730 in total fiber length recovered
13:45	Station 0610, Underlying Sediment	48.820 in total fiber length recovered
14:00	Station 0609, Armor Layer	56.137 in total fiber length recovered
14:10	Station 0609, Active Layer	48.098 in total fiber length recovered
14:30	Station 0609, Underlying Sediment	51.490 in total fiber length recovered

in -inches

All samplers processed on this day were done so in the AECOM warehouse located at 1 Madison Street, Rutherford, New Jersey. The fibers removed from the underlying sediment layer SPME sampler at cap Station 0610, which was bent upon retrieval, had more small fragments than other samplers; the total fiber length recovered for this sampler was also below average.

The sample bottles from this day and the previous two days (total 34 vials of fibers) were placed in a cooler along with all sediment sample bottles and bubble wrap.

References

AECOM. 2015. Quality Assurance Project Plan, Lower Passaic River Restoration Project, River Mile 10.9 Post-Construction Monitoring – Draft. Rev. 1. December 4.

Attachment 1
Photographs of Field Activities

A selection of photographs from this field effort is provided in this attachment.

Photograph 1: Retrieval of SPME samplers from location 0603.

12/10/2019

Photograph 2: Using a water sprayer to wash off SMPE samplers after retrieval from the sediment before bringing on shore for processing.

12/10/2019

Photograph 3: Armor, active, and underlying sediment layer samplers from location 0601 after retrieval.

12/10/2019

Photograph 4: H. Jones cutting open sampler to remove fibers to begin cleaning and measuring process.

12/10/2019

Photograph 5: H. Jones removing fibers from Henry Sampler and placing them temporarily in a foil pan.

12/10/2019

Photograph 6: H. Jones holding fibers with a pair of tweezers and washing off residue from fibers using Talex water.

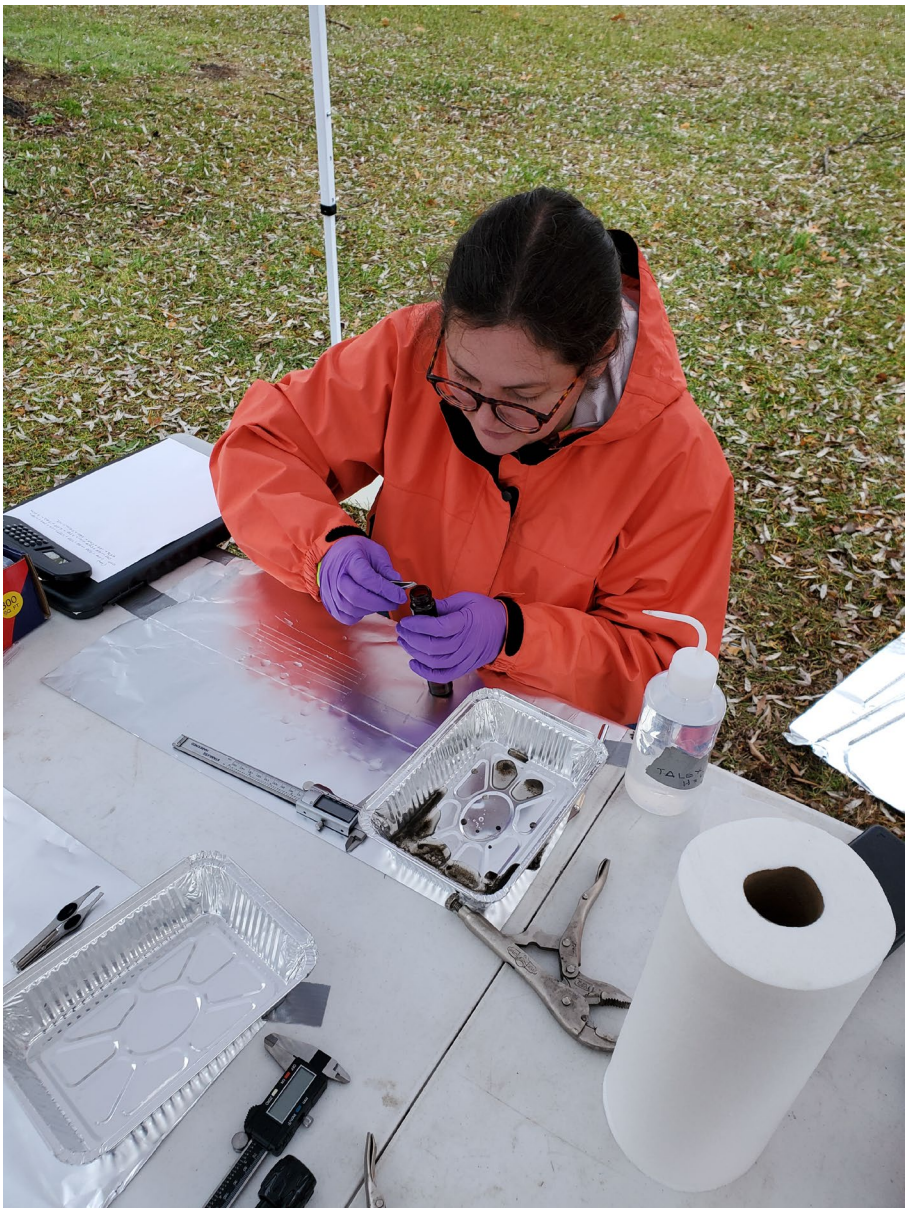
12/10/2019

Photograph 7: H. Jones cleaning off removed fibers from sampler and placing them parallel on a tin foil sheet to prepare for measurements.

12/10/2019

Photograph 8: H. Jones using a caliper to determine the lengths of individual fibers removed from sampler.

12/10/2019

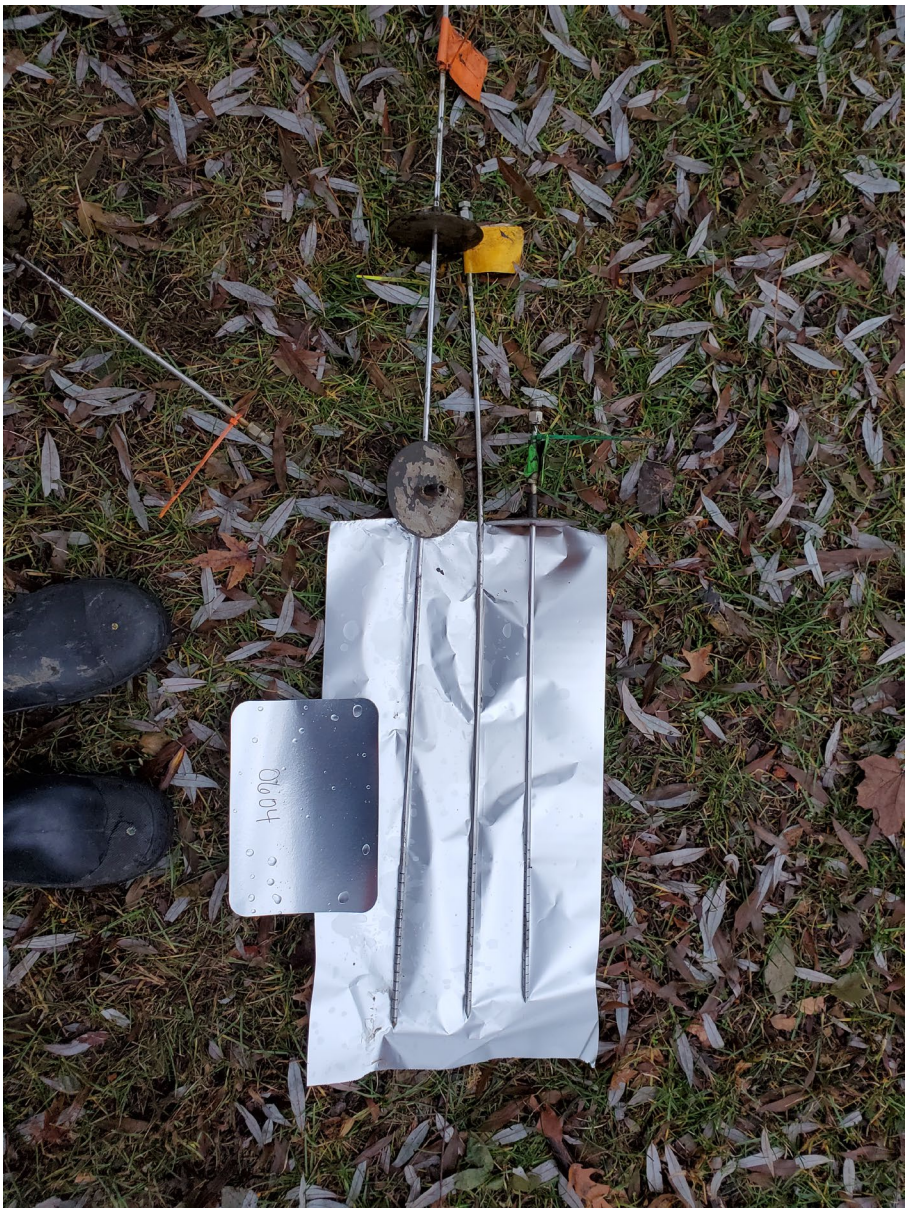


Photograph 9: H. Jones using tweezers to pick up measured fibers and placing them in labeled amber vial.

12/10/2019

Photograph 10: H. Jones and B. Barra processing measuring fibers and placing them in labeled amber vials.

12/10/2019

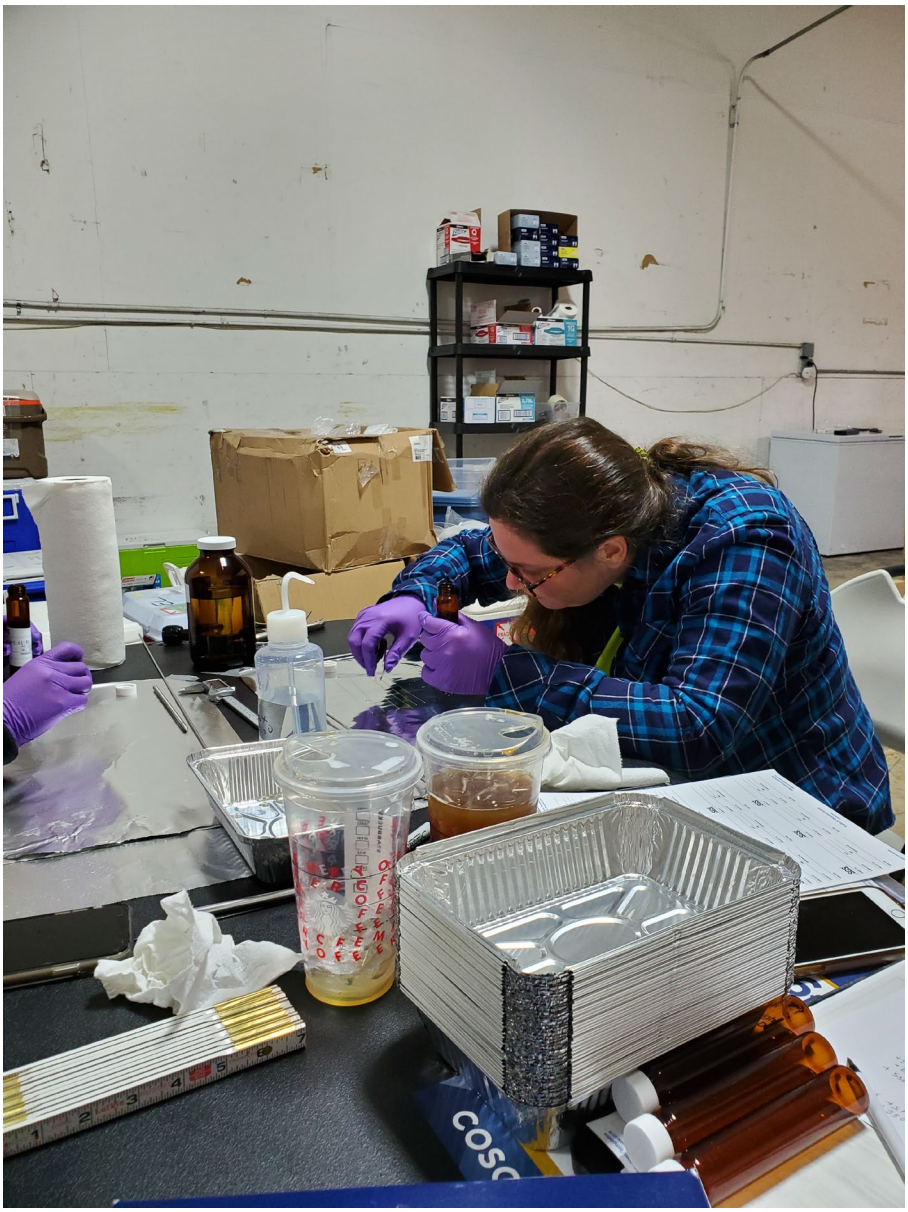


Photograph 11: Active, armor, and underlying sediment samplers from location 0604. Active layer sampler (yellow) was bent at the top upon retrieval.

12/10/2019

Photograph 12: H. Jones measuring cleaned fibers at the end of the day while B. Barra records the measurements and M. Smith provides extra lighting.

12/10/2019



Photograph 13: H. Jones adding measured fibers to labeled amber vial filled with Talex water.

12/11/2019

Photograph 14: C. Murphy-Hagan and C. Puopolo retrieving SPME samplers from location 0609. This location remained underwater during retrieval activities.

12/11/2019

Photograph 15: Unprocessed SPME samplers set up in warehouse on tin foil before being cut open.

12/12/2019

Photograph 16: Active, armor, and underlying sediment samplers from location 0610. Underlying sediment sampler (orange) is slightly bent where the fibers are housed towards the bottom.

12/12/2019

Photograph 17: C. Murphy-Hagan recording measurements of fibers while B. Barra uses the caliper to measure them.

12/12/2019

Attachment 2
Photographs of Field Logbook Notes and Fiber Measurements

Note: Two logbooks were used to record field activities. Consequently, logbook page numbering is not consecutive across oversight activities.

Location Rutherford, NJ Date 12/5/19

Project / Client LPR / USACE

Diamond Alkali 004 / CWCM

12⁰⁵ Arrive at RM 10.2. Set up YSI and tubing and label bottles

12¹⁵ WQ recorded. Samples collected from bottom of RM 10.2, flood. AECOM also collects duplicate from bottom.

12⁵⁰ YSI raised. WQ recorded. New tubing added.

12⁵⁵ Samples collected from top of RM 10.2, flood.

13¹⁰ Final WQ + vertical profile taken. Boat heads back to dock.

14⁰⁰ TG offsite

12/5/19

Location Rutherford NJ Date 12/10/19

Project / Client LPR / USACE

RM 10.9 SPME

11³⁰ TG onsite

Weather: 57°F light rain

PPE: Level D, tyvek

Purpose: Retrieval of pore water samplers from RM 10.9 cap.

11⁵⁰ AECOM personell onsite and begin unloading all equipment.

12⁰⁰ Scouting locations to see if samplers are exposed from the tide. H+S meeting on shore. Slips/trips/falls. Getting all equipment under canopy, heavy rain begins.

13⁴⁰ Bring all 3 samplers from 0603 back to shore. Spray them clean. Collect sediment sample from 0603 from surface muds, representative of top soil. Process: Armor layer sampler (green). Cut sampler open outside of screening range. Remove fibers from sampler, Cut fibers off, next to teflon tape, not from under tape. Rinse with DI water, to

12/10/19

Rite in the Rain

Location Rutherford NJ Date 12/10/19

Project / Client LPR / USACE

RM 10.9 SPME

get all mud off. Cut fibers off tape from other end too. Rec fibers held in foil tray. Spray DI water in sampler to ensure all fibers removed. Take fibers out of tin and place on tin foil to be cleaned individually. All fibers lined up parallel on foil after cleaning. Zero out caliper for measuring fibers, set in inches. Measure all individual fiber longhts and record them. Fiber lengths recorded on paper. TG takes picture on phone of all fiber measurements. Put all fibers in labeled vial, amber, filled with DI water. Some fibers are too long to fit in vial, needed to be broken in half then added to vial. Using tweezers to pick up each fiber and then place fibers in vial, (top of tweezers touch water in vial, not sure if problem). Cap vial, store. This is repeated for all samplers.

12/10

Location Rutherford NJ Date 12/10/19

Project / Client LPR / USACE

RM 10.9 SPME

14^{25} Begin same process on active and sediment layer samplers. Will not record whole process, only major notes. Remove fibers and wash off. Individually clean each fiber and lay out. [Samplers brought on shore from 0601/0602 at this time] All fibers measured. Picture of lengths taken. Noted that armor (yellow) layer fibers slightly dirty upon collection. Fibers put in vials with DI water.

15^{10} 0604 sediment samples and SPME samplers brought on shore.

15^{20} Begin fiber processing on 0601. First measure sampler length to confirm same as during deployment. Old samplers (empty) are placed back in the river, so locations can be found for the next event. Remove fibers and clean and measure. [Noted that the active layer sampler from 0604 is very slightly bent] → picture taken.

15^{50} Crew returns from retrieval.

Rite in the Rain

Location Rutherford NJ Date 12/10/19

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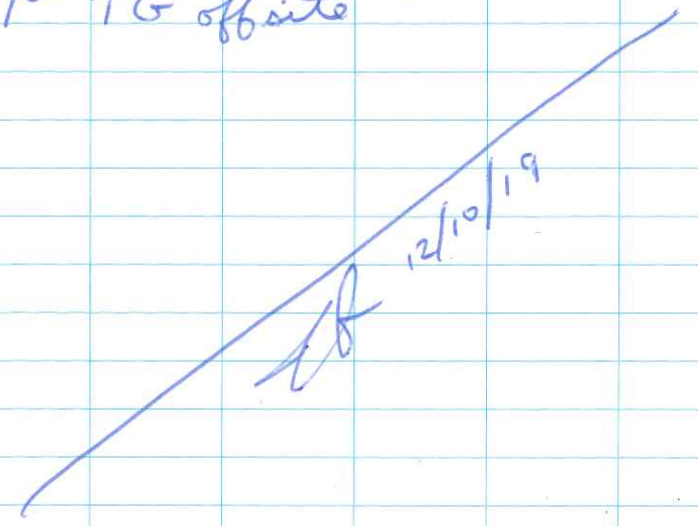
RM 10.9 SPME

16[15] Armor and active layer fibers added to vials with DI water. Begin processing sediment layer fibers. All other samplers that were removed are wrapped in tin Foil to be processed tomorrow. 601 will be last one processed today. Fibers measured and add placed in vial with DI water. Done processing. Pic taken of measurements.

16[30] Packing up equipment.

17[00] TG offsite



Location Rutherford NJ Date 12/11/19

Project / Client LPR / USACE

RM 10.9 SPME

10[00] TG onsite at Madison St Warehouse B2.

Weather: 35°F, cloudy, snow on ground

PPE: Level D

Purpose: Continue fiber retrieval and processing.

10[15] AECOM personel processing 0602 fibers upon arrival. Measuring sampler length. Cut open samplers and remove fibers. Individually clean. Measure all fibers and record. TG takes picture of measurements. Armor and active layer being processed first (only 2 people working at a time). Fibers added to labeled amber vial with DI water. Set aside

11[00] Begin processing underlying sediment sampler. Remove fibers from sampler, individually clean fibers and measure. Some fibers stuck in sampler, resulting in small fiber lengths. All measurements taken. Fibers put in vial with DI water.

11[30] Begin processing of 0604. Armor + active layer samplers processed first. Active layer sampler bent @

Location Rutherford NJ Date 12/11/19

Project / Client LPR / USACE

RM 10.9 SPME

11[30] cont	top of rod. Upon removal of sampler from casing, does not appear bent. Remove fibers from sampler and clean + measure (armor + active). Fibers all mostly intact, some very small pieces from active layer. All measurements recorded. Fibers added to vial with DI water.
12[15]	Begin processing underlying sed. sampler from 0604. Cut sampler and remove fibers. Clean and measure fibers, mostly in tact. Add to DI filled vial and seal.
13[00]	AECOM + TG head to park to start collecting remaining samples. Planning a duplicate sediment sample @ 0606.
13[15]	Arrive @ staging area, AECOM starts unloading equipment to prepare for sampler retrieval.
13[40]	AECOM crew heads out to retrieve samplers. TG will be with shore crew, no need to wait with retrieval team.

Location Rutherford NJ Date 12/11/19

Project / Client LPR / USACE

RM 10.9 SPME

13[50]	Before removal of samplers, AECOM collects sediment depth measurements at each location again.
14[10]	Samplers from 0607 collected, as well as sediment sample. All samplers will be processed tomorrow
14[45]	Sampler 0606 and its duplicate ~~at~~ retrieved. Sediment sample + duplicate collected. Waiting for tide to go out more.
15[10]	Sampler 0608 and sediment samples collected
15[30]	Sampler 0610 and sediment samples collected
15[50]	Samplers and sediment sample taken from 0609. 0609 samplers were still underwater upon retrieval, due to high tide coming back.
16[30]	TG offsite

12/11/19

Rite in the Rain

Location Lyndhurst, NJ Date 3/22/19

Project / Client USEPA/USACE Passaic RM 10.9 Cap Inspection

no cap or mat found.

1359 Measuring offset. Depth to sed 5.2' depth to gravel 8.4' Location is X-9 North.

1402 Measuring offset. Depth to sed 5.8' depth to gravel 9.4'. Location X-7 North

1414 H-3.5, depth to sed 5.4' depth to armor 5.8' collected between H-3/H-4

1416 H-8, depth to sed 7.3' depth to gravel 10.9'

1420 H-9 depth to sed 7.8' depth to "soft refusal" 15' pole was not long enough, felt like mud all the way

1425 Y-2 depth to sed 8.9' depth to "rock" 10.2', doesn't feel like armor.

1430 Y-3 depth to sed 10.6' depth to soft refusal 14.5'

1435 Y-4 depth to sed 10.2' depth to cobble 10.7'

1438 Boat heads to dock

1515 T. G- offsite

Location Rutherford NJ Date 12/12/19

Project / Client LPR / USACE RM 10.9 SPME

900 TG onsite

Weather: 30°F, sunny

PPE: Level D

Purpose: Finish processing fibers that were collected yesterday.

930 AECOM personell onsite, moving into warehouse BZ to start processing. Will process the rest of the fibers collected yesterday to finish up work. Last day of work

950 Setting up @ table in warehouse. Will split into 2 groups. One to lay out samplers, one to measure and bottle fibers. Collecting field blank sample, which is just an unused sampler with clean fibers sent in. Measure vials and place in vials.

1015 Begin processing 0607 samplers. Armor and active layers first. Remove, clean, and measure fibers. On top of washing, sometimes they wipe off fibers with fingers. [Noted that sediment layer sampler from 0610 is bent on the screening area.

Rite in the Rain

Location Rutherford NJ Date 12/12/19

Project / Client LPR / USACE

RM 10.9 SPME

10[15] cont	Armor + active fibers measured and placed in DI water sample vials.
10[50]	Begin work on sediment sampler from 0607. Concurrently working on armor sampler from 0606. Fibers cleaned and measured. 0607 is done.
11[25]	Finishing up active and sediment layer samplers from 0606. Cleaning and measuring fibers. Placed in vials with DI water.
11[35]	Begin processing 0606 duplicate samplers. Duplicates for all 3 samplers. Remove armor layer fibers and rinse and measure. Place in vials with DI water. Move on to active + sediment layer samplers. Rinse and clean and measure fibers. Fibers put in vials with DI water.
12[10]	Process 0608 samplers. Cut open sampler and remove, clean, and measure fibers. Add fibers to vials with DI water. All 3 samplers completed no errors.

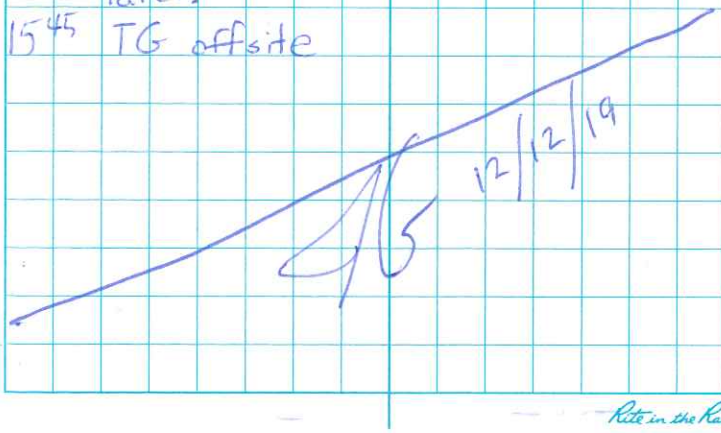
12/12/19

Location Rutherford NJ Date 12/12/19

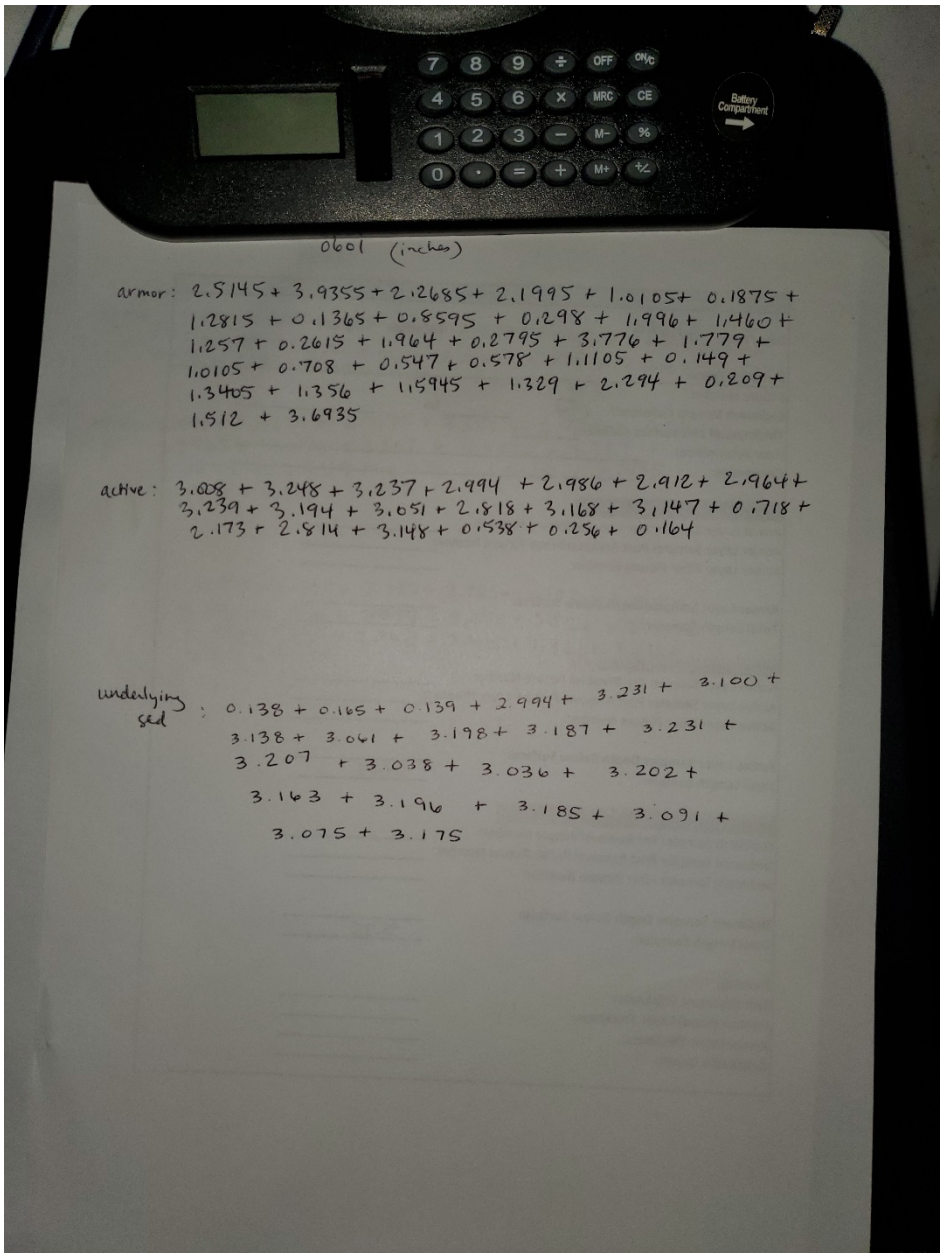
Project / Client LPR / USACE

RM 10.9 SPME

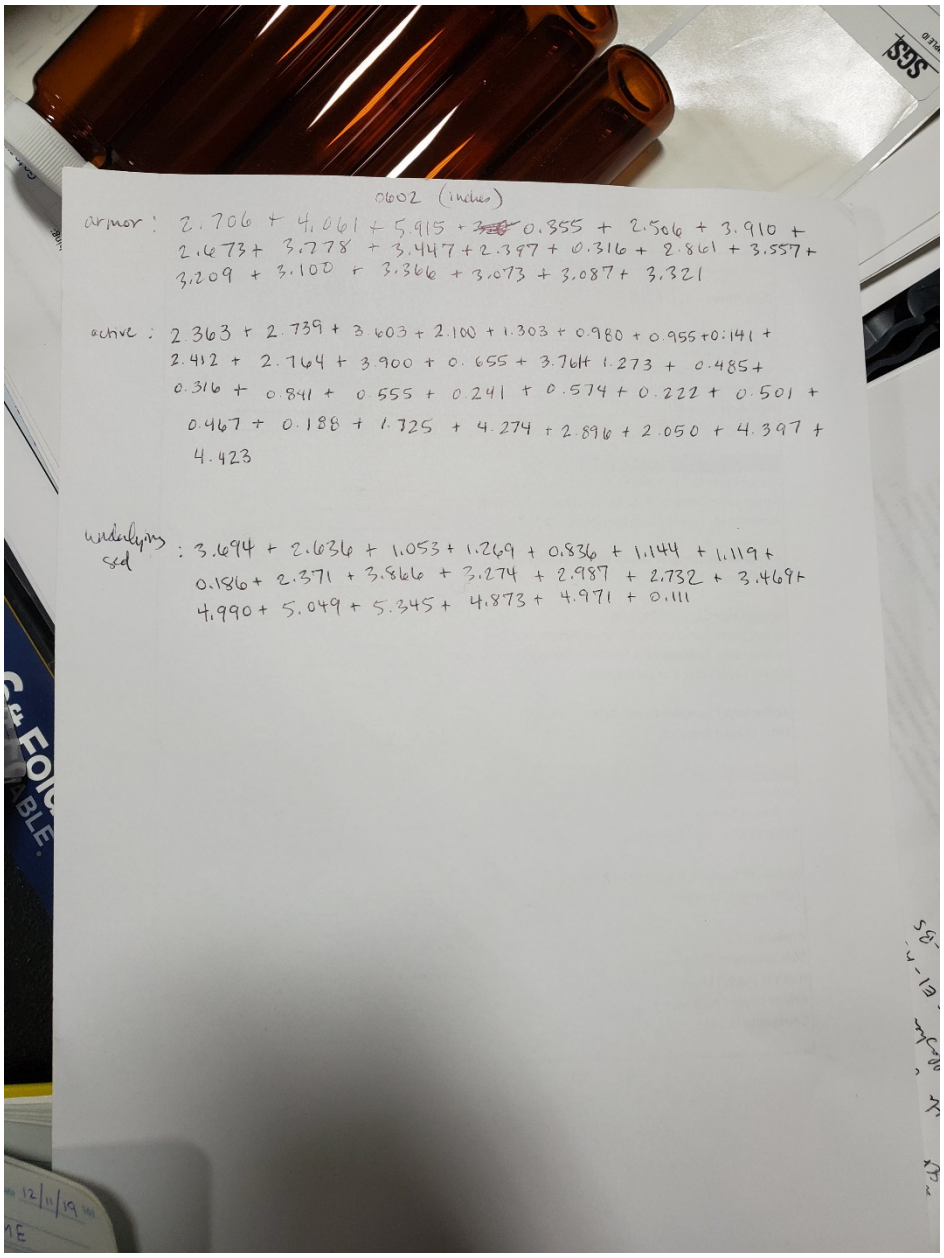
13[15]	TG offsite to grab lunch.
13[25]	TG back onsite. AECOM is processing 0610. Underlying sediment sampler is bent where the fibers sit. Fibers removed from sediment sampler still in good shape, some pretty small fragments. All fibers from each sampler placed in vial with DI water.
14[00]	Begin processing samplers from 0609. All fibers removed from sampler and cleaned and measured. Fibers added to vial and DI water added. All samplers processed. Pictures of all measurements taken; to be logged later.
15[45]	TG offsite



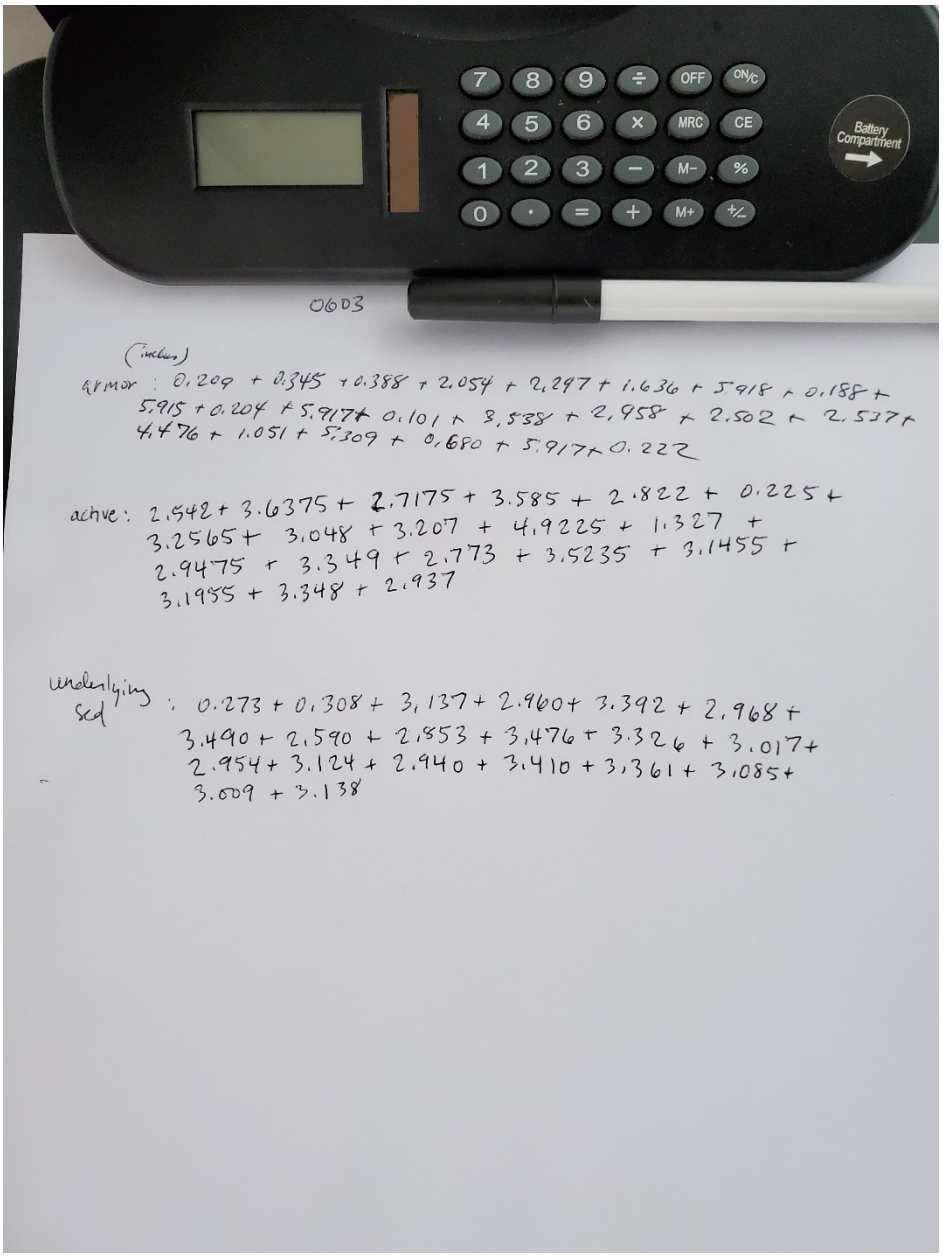
Rite in the Rain



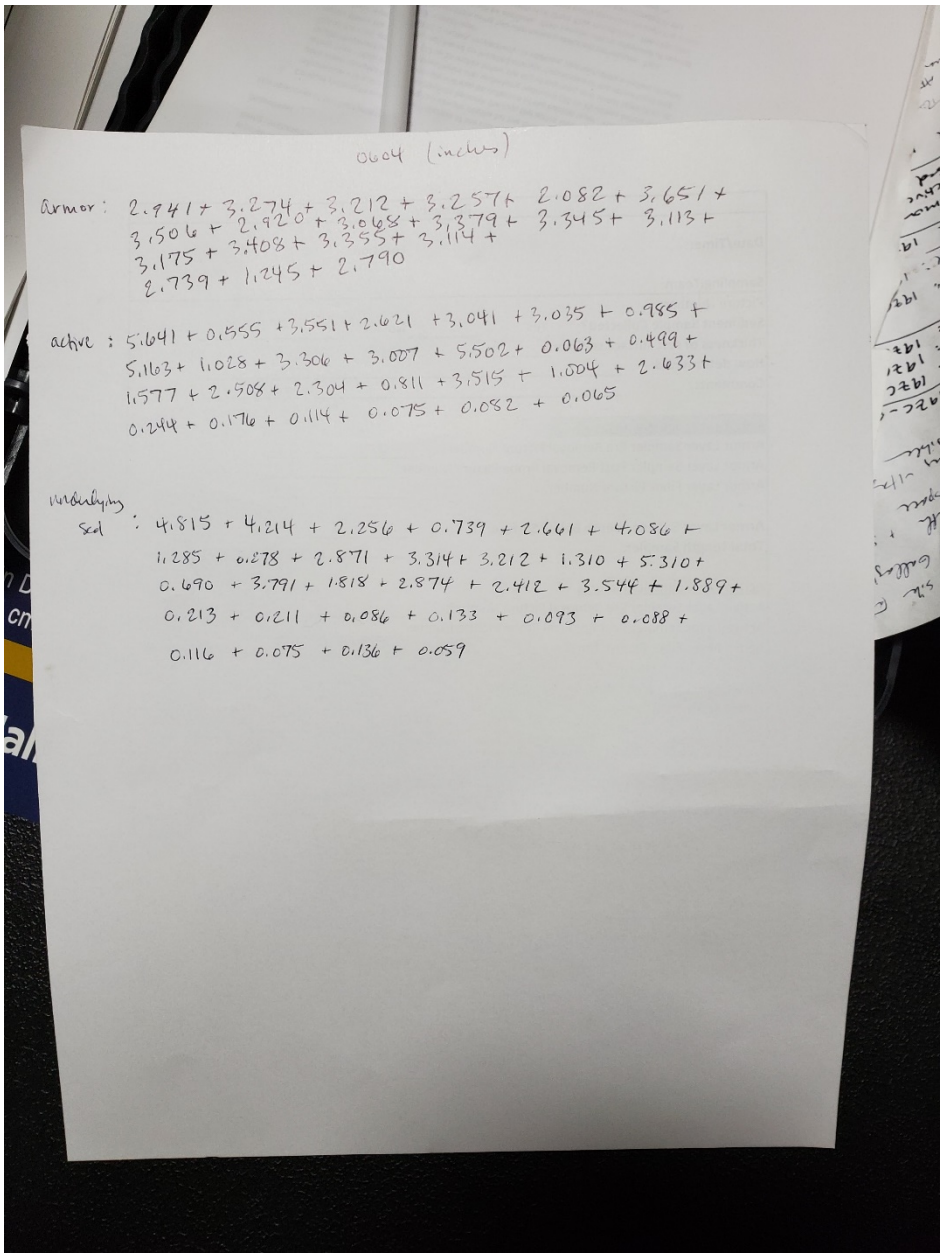
Measured fiber lengths from all three SPME samplers from cap Station 0601



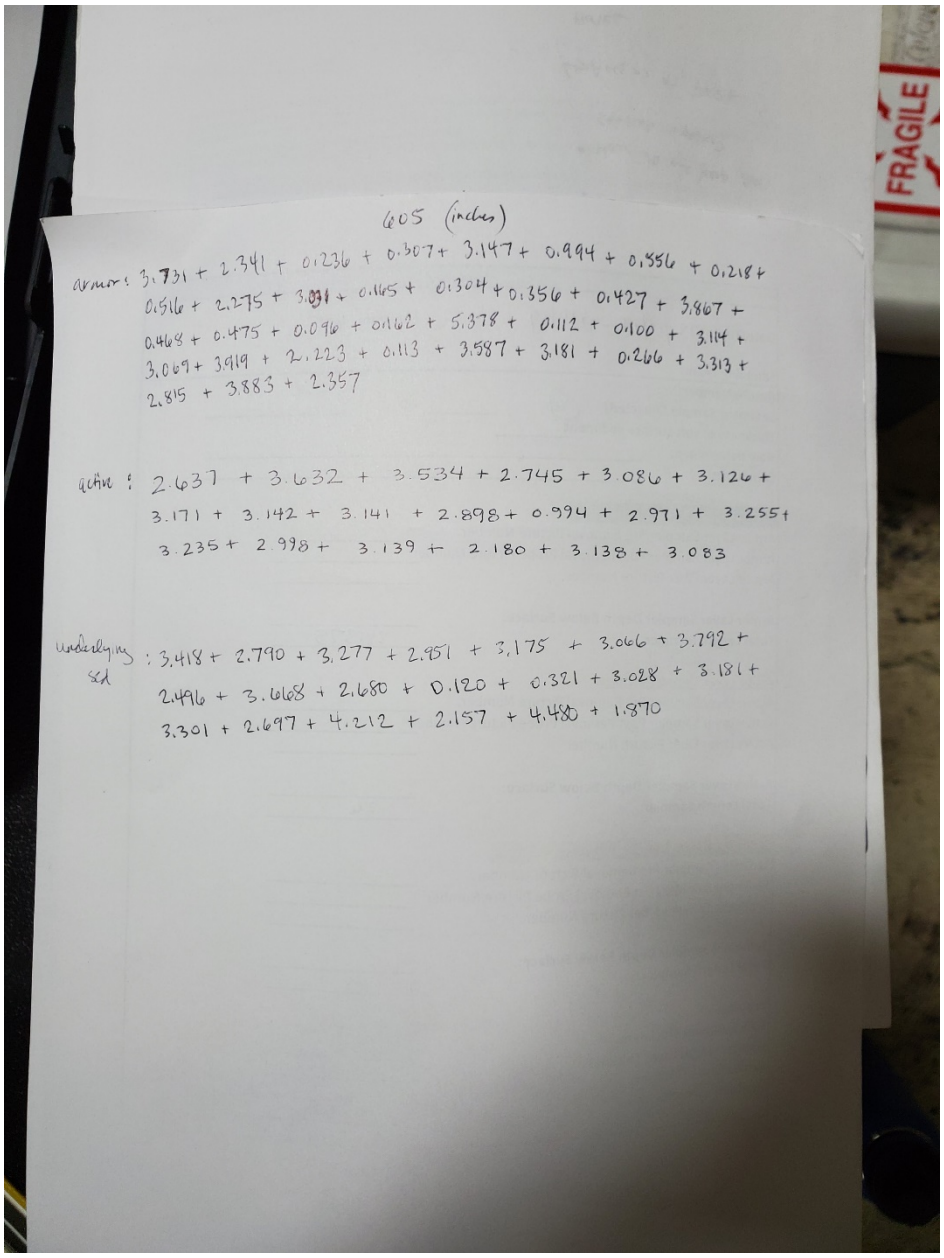
Measured fiber lengths from all three SPME samplers from cap Station 0602



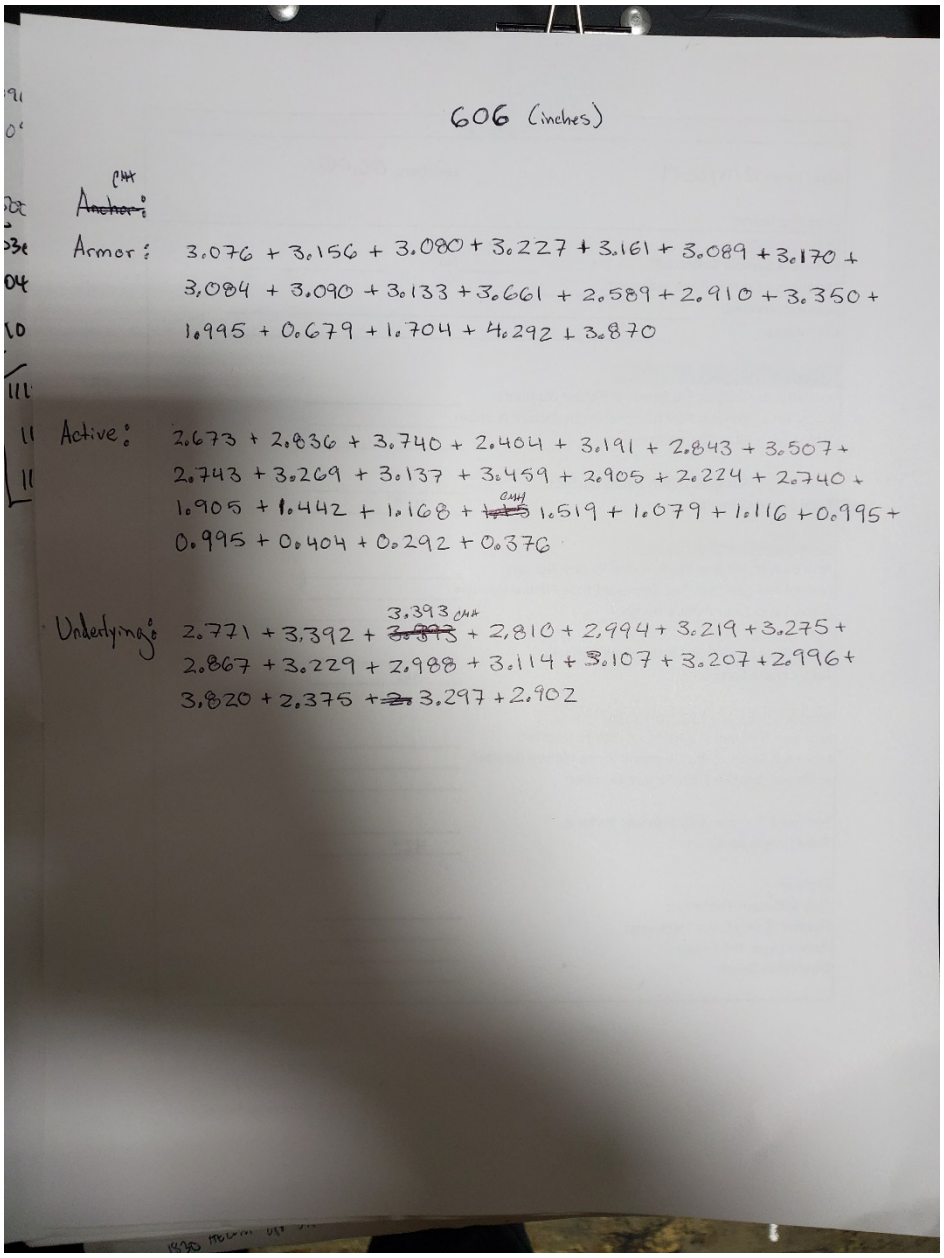
Measured fiber lengths from all three SPME samplers from cap Station 0603



Measured fiber lengths from all three SPME samplers from cap Station 0604



Measured fiber lengths from all three SPME samplers from cap Station 0605



606 (inches)

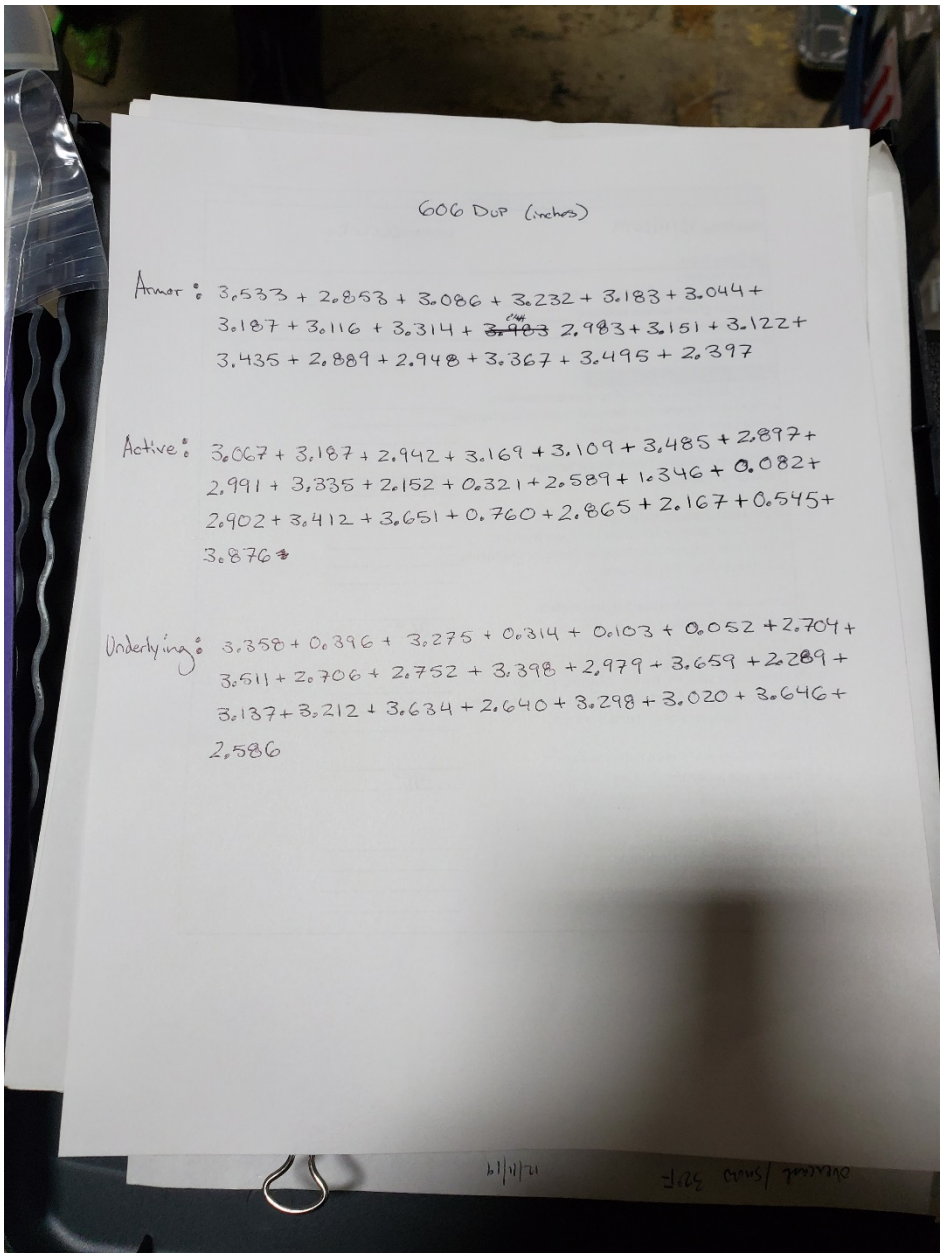
~~Anchor~~:

Armor: 3.076 + 3.156 + 3.080 + 3.227 + 3.161 + 3.089 + 3.170 +
3.084 + 3.090 + 3.133 + 3.661 + 2.589 + 2.910 + 3.350 +
1.995 + 0.679 + 1.704 + 4.292 + 3.870

Active: 2.673 + 2.836 + 3.740 + 2.404 + 3.191 + 2.843 + 3.507 +
2.743 + 3.269 + 3.137 + 3.459 + 2.905 + 2.224 + 2.740 +
1.905 + 1.442 + 1.168 + ~~1.605~~ 1.519 + 1.079 + 1.116 + 0.995 +
0.995 + 0.404 + 0.292 + 0.376

Underlying: 2.771 + 3.392 + ~~3.393~~ 3.393 + 2.810 + 2.994 + 3.219 + 3.275 +
2.867 + 3.229 + 2.988 + 3.114 + 3.107 + 3.207 + 2.996 +
3.820 + 2.375 + ~~2.~~ 3.297 + 2.902

Measured fiber lengths from all three SPME samplers from cap Station 0606

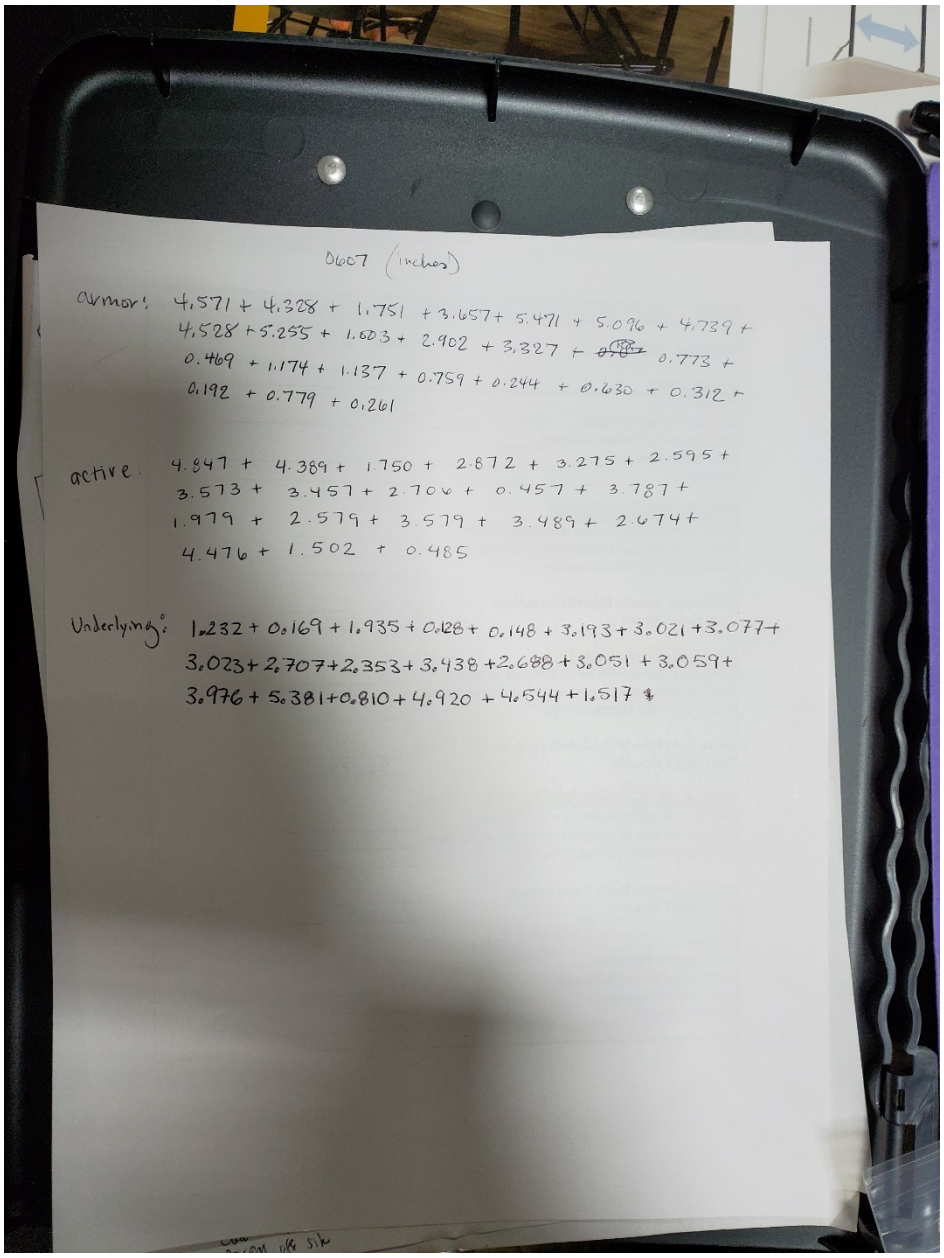


606 Dup (inches)

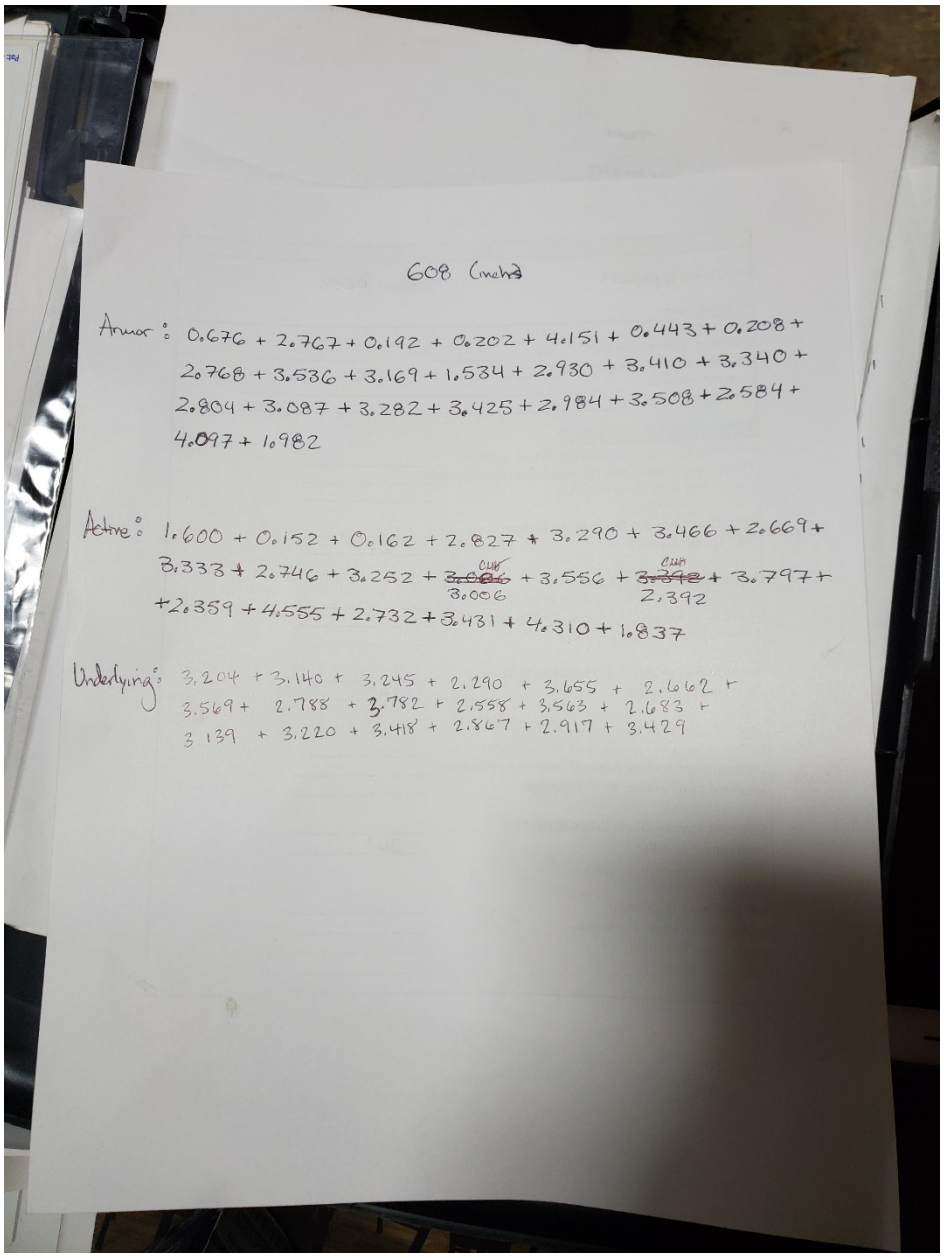
Armor: 3.533 + 2.853 + 3.086 + 3.232 + 3.183 + 3.044 +
3.187 + 3.116 + 3.314 + ~~3.483~~ 2.983 + 3.151 + 3.122 +
3.435 + 2.889 + 2.948 + 3.367 + 3.495 + 2.397

Active: 3.067 + 3.187 + 2.942 + 3.169 + 3.109 + 3.485 + 2.897 +
2.991 + 3.335 + 2.152 + 0.321 + 2.589 + 1.346 + 0.082 +
2.902 + 3.412 + 3.651 + 0.760 + 2.865 + 2.167 + 0.545 +
3.876

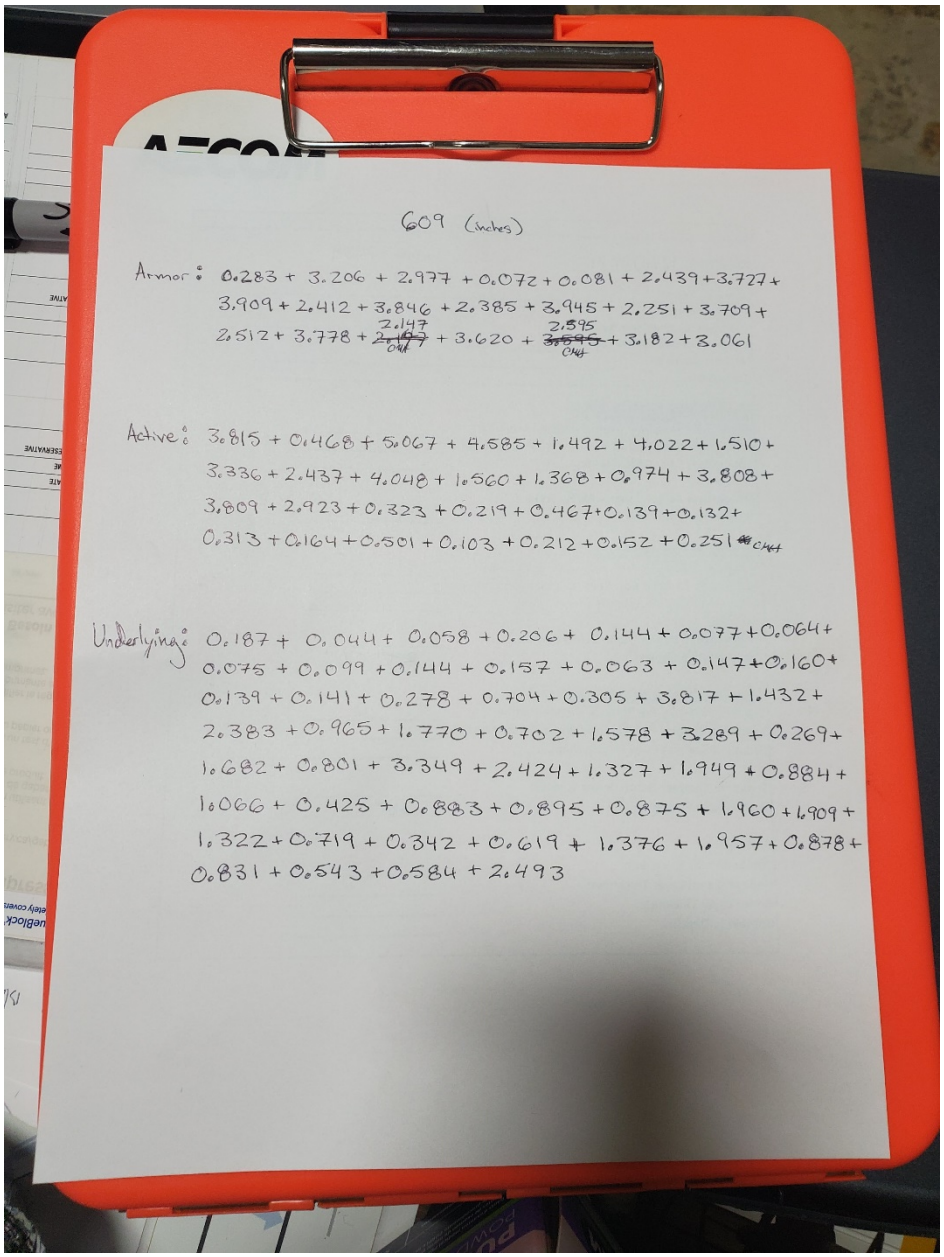
Underlying: 3.358 + 0.396 + 3.275 + 0.314 + 0.103 + 0.052 + 2.704 +
3.511 + 2.706 + 2.752 + 3.398 + 2.979 + 3.659 + 2.289 +
3.137 + 3.212 + 3.634 + 2.640 + 3.298 + 3.020 + 3.646 +
2.586



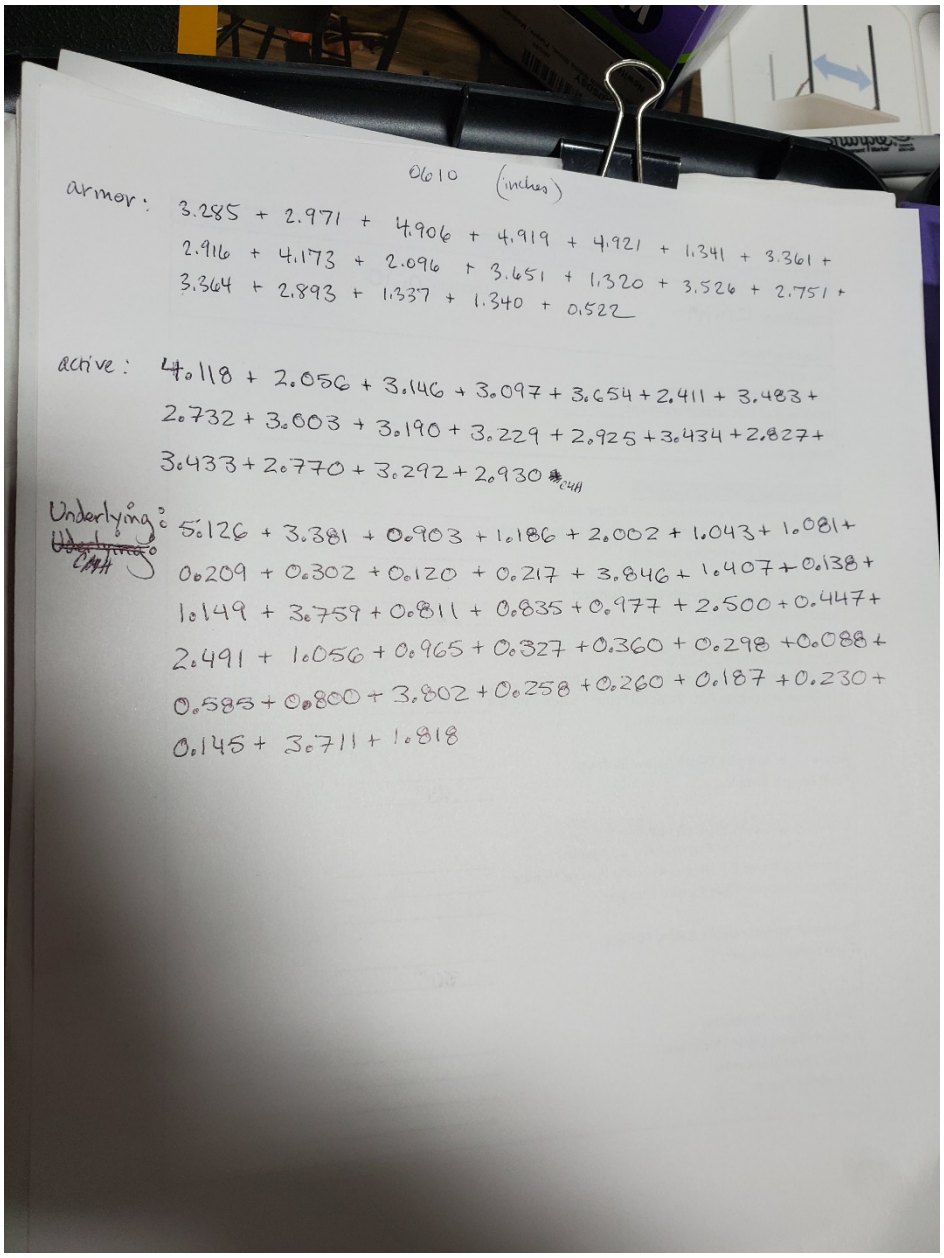
Measured fiber lengths from all three SPME samplers from cap Station 0607



Measured fiber lengths from all three SPME samplers from cap Station 0608



Measured fiber lengths from all three SPME samplers from cap Station 0609



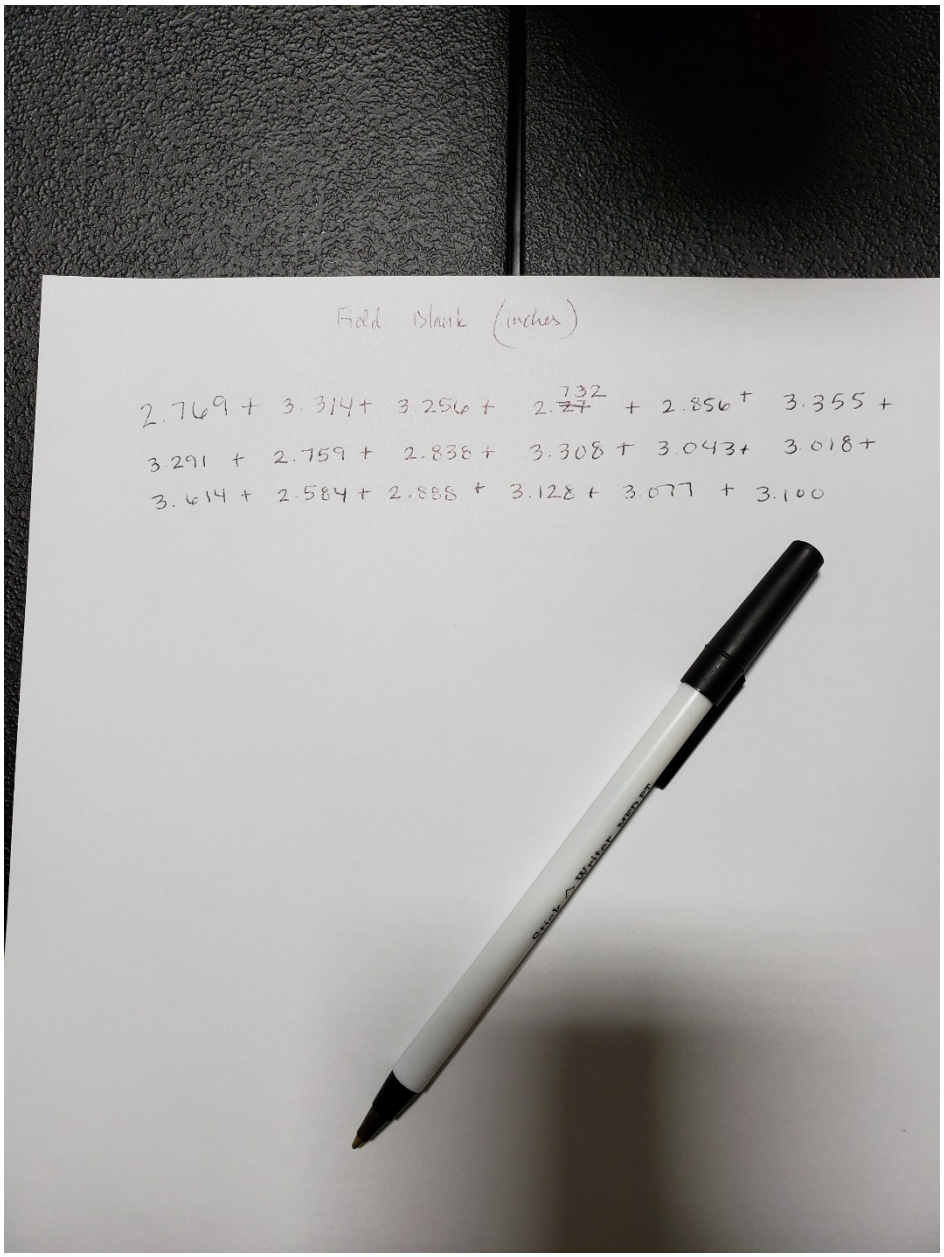
0610 (inches)

armor: 3.285 + 2.971 + 4.906 + 4.919 + 4.921 + 1.341 + 3.361 +
2.916 + 4.173 + 2.096 + 3.651 + 1.320 + 3.526 + 2.751 +
3.364 + 2.893 + 1.337 + 1.340 + 0.522

active: 4.118 + 2.056 + 3.146 + 3.097 + 3.654 + 2.411 + 3.483 +
2.732 + 3.003 + 3.190 + 3.229 + 2.925 + 3.434 + 2.827 +
3.433 + 2.770 + 3.292 + 2.930 CAH

Underlying: 5.126 + 3.381 + 0.903 + 1.186 + 2.002 + 1.043 + 1.081 +
0.209 + 0.302 + 0.120 + 0.217 + 3.846 + 1.407 + 0.138 +
1.149 + 3.759 + 0.811 + 0.835 + 0.977 + 2.500 + 0.447 +
2.491 + 1.056 + 0.965 + 0.327 + 0.360 + 0.298 + 0.088 +
0.585 + 0.800 + 3.802 + 0.258 + 0.260 + 0.187 + 0.230 +
0.145 + 3.711 + 1.818

Measured fiber lengths from all three SPME samplers from cap Station 0610



Measured fiber lengths from field blank SPME sampler